

## CLAIMS

1. A configurable controller comprising:

a synchronization control module;

a plurality of configurable signal acquisition modules

5 connected with said synchronization control module;

a control logic connected with said plurality of signal acquisition modules;

a plurality of identical input cells respectively connected with

said plurality of signal acquisition modules, each of said

10 plurality of input cells additionally connected with a

respective input pin of said controller; and

a synchronizing signal generator connected with said

synchronization control module and with said plurality of input

cells,

15 wherein each one of said plurality of input cells is operable to convert input

signal parameters to time-based parameters; and wherein each of said signal

acquisition modules is configured to convert said time-based parameters to a

required digital form.

20 2. The configurable controller of claim 1, wherein each of said plurality of identical

input cells comprises a comparator, said comparator adapted to receive an input

signal from the respective input pin, and a synchronization signal from said

synchronizing signal generator, and to output a signal.

3. The configurable controller of claim 2, wherein said synchronization signal has a saw-teeth shape.

4. The configurable controller of claim 1, wherein said configurable controller additionally comprises a plurality of configurable output control logic modules connected with said control logic, said controller additionally comprising a plurality of high-side and low-side output drivers connected with said configurable output control logic modules, said drivers additionally connected with a plurality of output pins of said controller.

5. The configurable controller of claim 4, wherein at least one of said configurable output control logic modules is connected to one pair of high-side driver and low-side driver, said drivers connected through respective output pins of said controller to one side of a load, wherein said configurable output control logic module is configured to drive only one of said high-side driver and low-side driver, depending on said load's other side connection.

6. The configurable controller of claim 4, wherein at least one of said configurable output control logic modules is connected to one of said low-side drivers or to one of said high-side drivers, said one driver connected through a respective output pin of said controller to a load, wherein said configurable output control logic module is configured to drive said one driver.

7. The configurable controller of claim 4, wherein a first and second ones of said configurable output control logic modules are connected respectively to one pair of

high-side driver and low-side driver, said high-side driver and said low-side driver connected through two respective output pins of said controller to two sides of a load, wherein said first and second configurable output control logic modules are configured to control said pair of high-side driver and low-side driver by two  
5 independent signal sources.

8. The configurable controller of claim 4, wherein at least one of said configurable output control logic modules is connected to two of said high-side drivers, said two high-side drivers connected through respective output pins of said controller to one  
10 side of a load, wherein said configurable output control logic module is configured to simultaneously control said two high-side drivers.

9. The configurable controller of claim 4, wherein at least one of said high-side or low-side drivers is connected to one of said input cells.  
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10. The configurable controller of claim 9, wherein said input cell is operable to measure the current of said at least one high-side or low-side driver.

11. The configurable controller of claim 10, wherein said input cell is operable to  
20 detect connectivity of said at least one high-side or low-side driver.

12. The configurable controller of claim 10, wherein said input cell is operable to confirm switching of said at least one high-side or low-side driver.

25 13. A method of acquiring a plurality of signals, comprising the steps

of:

providing a synchronization control module;

configuring a plurality of configurable signal acquisition

modules connected with said synchronization control

5 module;

providing a control logic connected with said plurality of signal

acquisition modules;

providing a plurality of identical input cells respectively

connected with said plurality of signal acquisition modules;

10 providing a synchronizing signal generator connected with said

synchronization control module and with said plurality of

input cells, acquiring a plurality of input signals, each said

signals acquired by one of said plurality of identical input

cells;

15 converting said acquired signal parameters into a plurality of

time-based parameters; and

converting said plurality of time-based parameters into required

digital forms.

20 14. The method of claim 13, wherein said step of converting said  
acquired signal parameters into a plurality of time-based parameters  
comprises the steps of:

receiving a synchronization signal from said synchronizing  
signal generator; and

25 comparing said acquired input signal with said synchronization

signal.

15. The method of claim 14, wherein said synchronization signal has a saw-teeth shape.

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16. A configurable controller for controlling a plurality of loads, comprising:

a control logic;

a plurality of configurable output control logic modules

connected with said control logic; and

10 a plurality of high-side and low-side output drivers connected with said configurable output control logic modules, said drivers additionally connected with a plurality of output pins of said controller.

15 17. The configurable controller of claim 16, wherein at least one of said configurable output control logic modules is connected to one pair of high-side driver and low-side driver, said drivers connected through respective output pins of said controller to one side of a load, wherein said configurable output control logic module is configured to drive only one of said high-side driver and low-side driver,  
20 depending on said load's other side connection.

18. The configurable controller of claim 16, wherein at least one of said configurable output control logic modules is connected to one of said low-side drivers or to one of said high-side drivers, said one driver connected through a respective output pin of

said controller to a load, wherein said configurable output control logic module is configured to drive said one driver.

19. The configurable controller of claim 16, wherein a first and second  
5 ones of said configurable output control logic modules are connected respectively to one pair of high-side driver and low-side driver, said high-side driver and said low-side driver connected through two respective output pins of said controller to two sides of a load, wherein said first and second configurable output control logic  
modules are configured to control said pair of high-side driver and low-side driver by  
10 two independent signal sources.

20. The configurable controller of claim 16, wherein at least one of said configurable  
output control logic modules is connected to two of said high-side drivers, said two  
high-side drivers connected through respective output pins of said controller to one  
15 side of a load, wherein said configurable output control logic module is configured to simultaneously control said two high-side drivers.

21. A method of controlling a plurality of loads, comprising the steps of:  
providing a control logic;  
20 providing a plurality of configurable output control logic  
modules connected with said control logic;  
providing a plurality of high-side and low-side output drivers  
connected with said configurable output control logic  
modules, said drivers additionally connected with a  
25 plurality of output pins of said controller; and

configuring each of said plurality of configurable output  
control logic modules to drive at least one of said high-  
side and low-side drivers, said configuring according  
to the connections between said loads and said drivers.

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22. The method of claim 21, wherein at least one of said configurable  
output control logic modules is connected to one pair of said high-side  
driver and low-side driver, said drivers connected through respective  
output pins of said controller to one side of a load, wherein said  
10 configurable output control logic module is configured to drive only one  
of said high-side driver and low-side driver, depending on said load's  
other side connection.

23. The method of claim 21, wherein at least one of said configurable output control  
15 logic modules is connected to one of said low-side drivers or to one of said high-side  
drivers, said one driver connected through a respective output pin of said controller  
to a load, wherein said configurable output control logic module is configured to drive  
said one driver.

20 24. The method of claim 21, wherein a first and second ones of said  
configurable output control logic modules are connected respectively to one pair of  
high-side driver and low-side driver, said high-side driver and said low-side driver  
connected through two respective output pins of said controller to two sides of a  
load, wherein said first and second configurable output control logic modules are

configured to control said pair of high-side driver and low-side driver by two independent signal sources.

25. The method of claim 21, wherein at least one of said configurable  
5 output control logic modules is connected to two of said high-side drivers, said two high-side drivers connected through respective output pins of said controller to one side of a load, wherein said configurable output control logic module is configured to simultaneously control said two high-side drivers.

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